ET420197679US

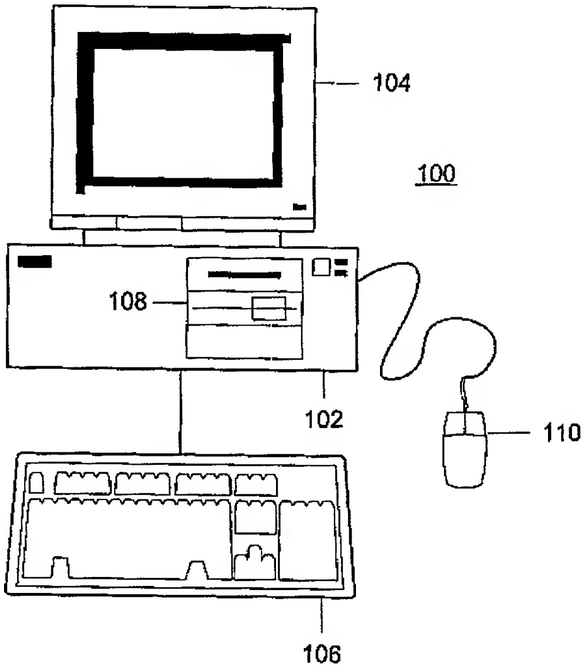

Figure 1

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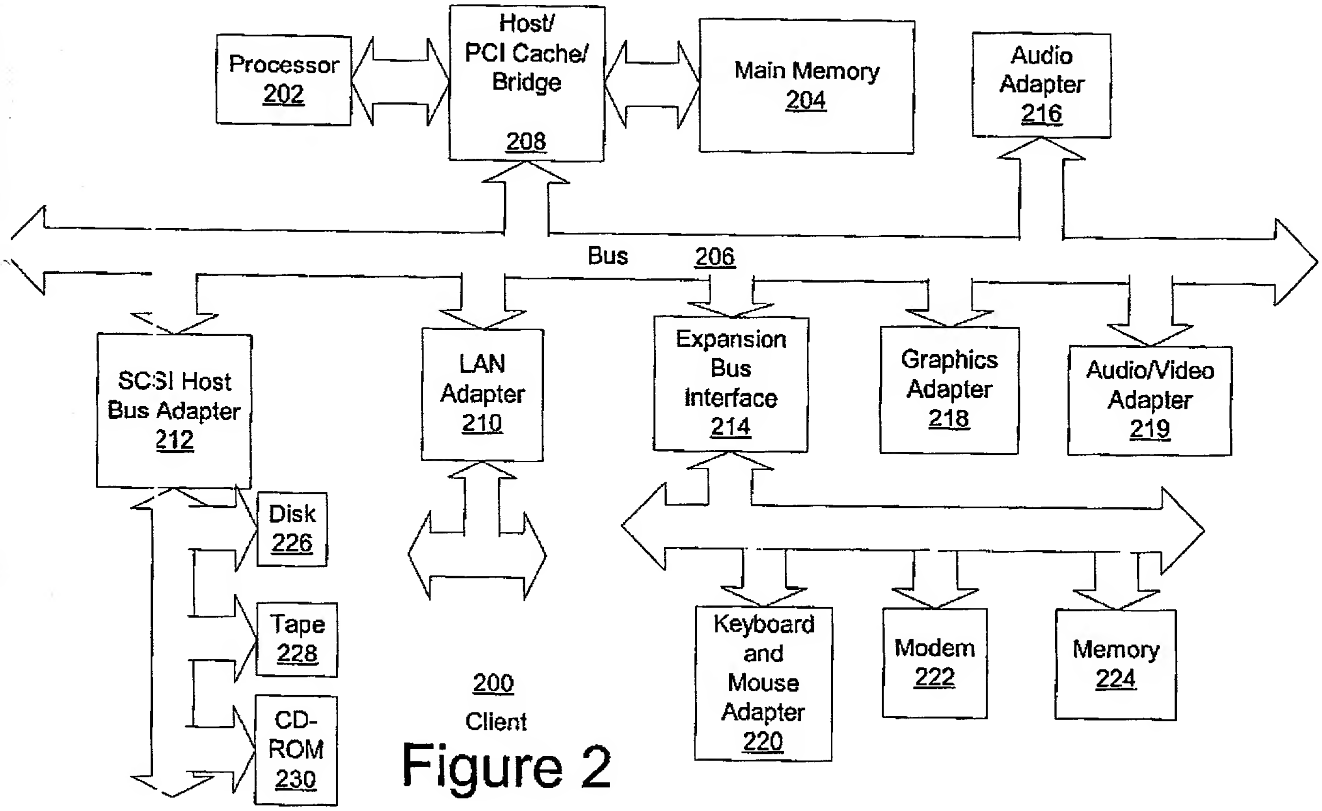

Figure 2

Figure 3

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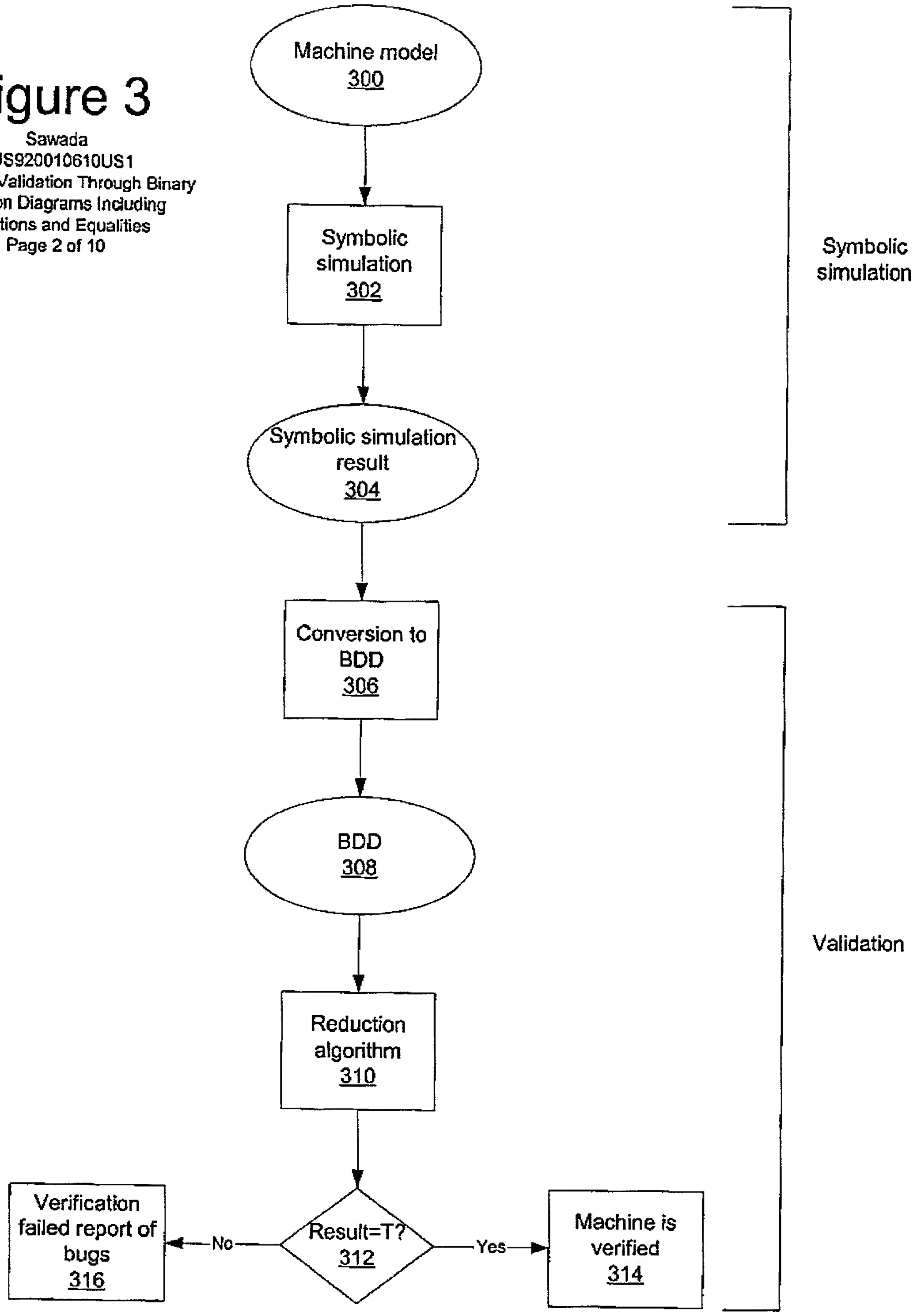

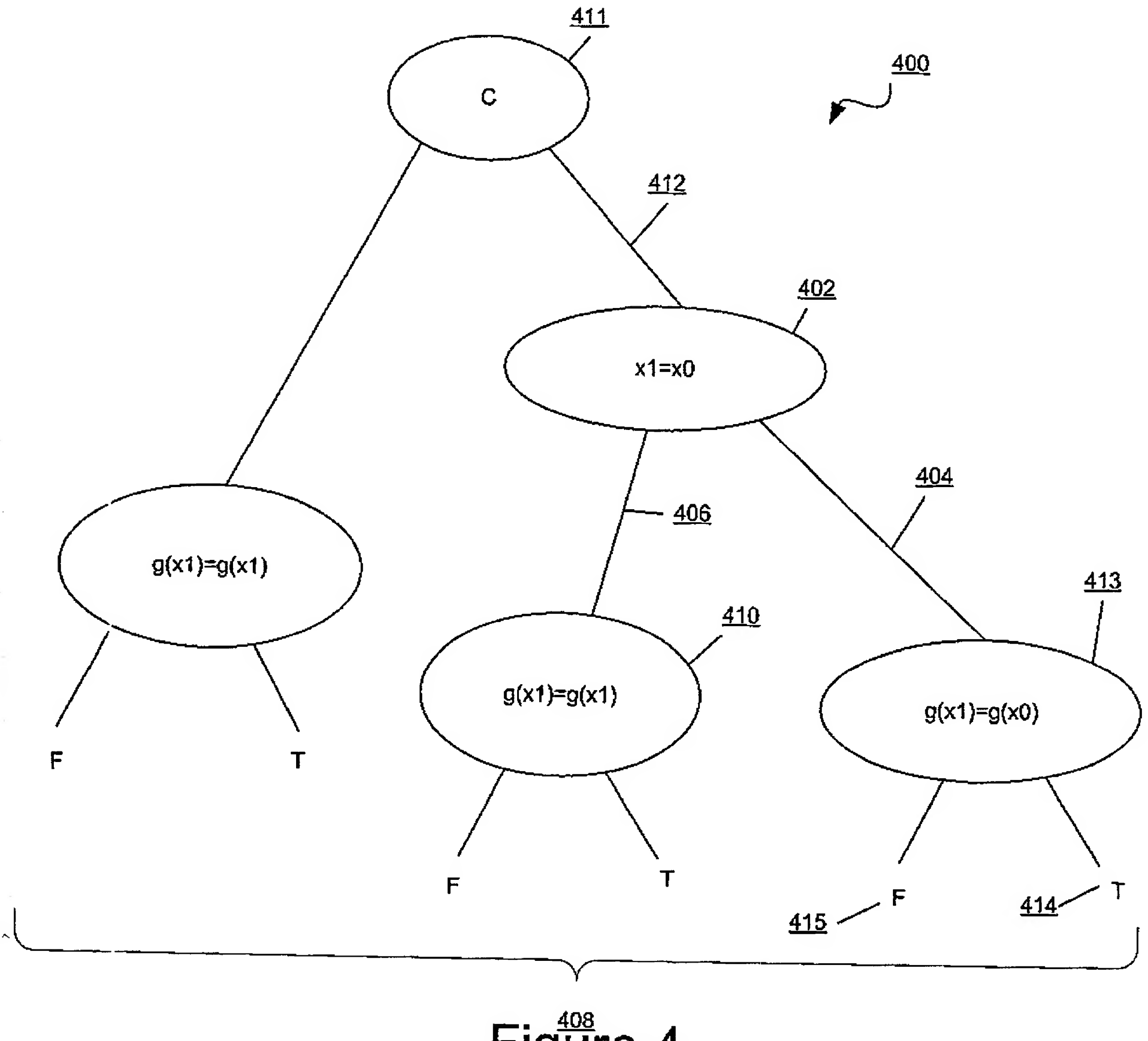

Figure 4

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and Equalities

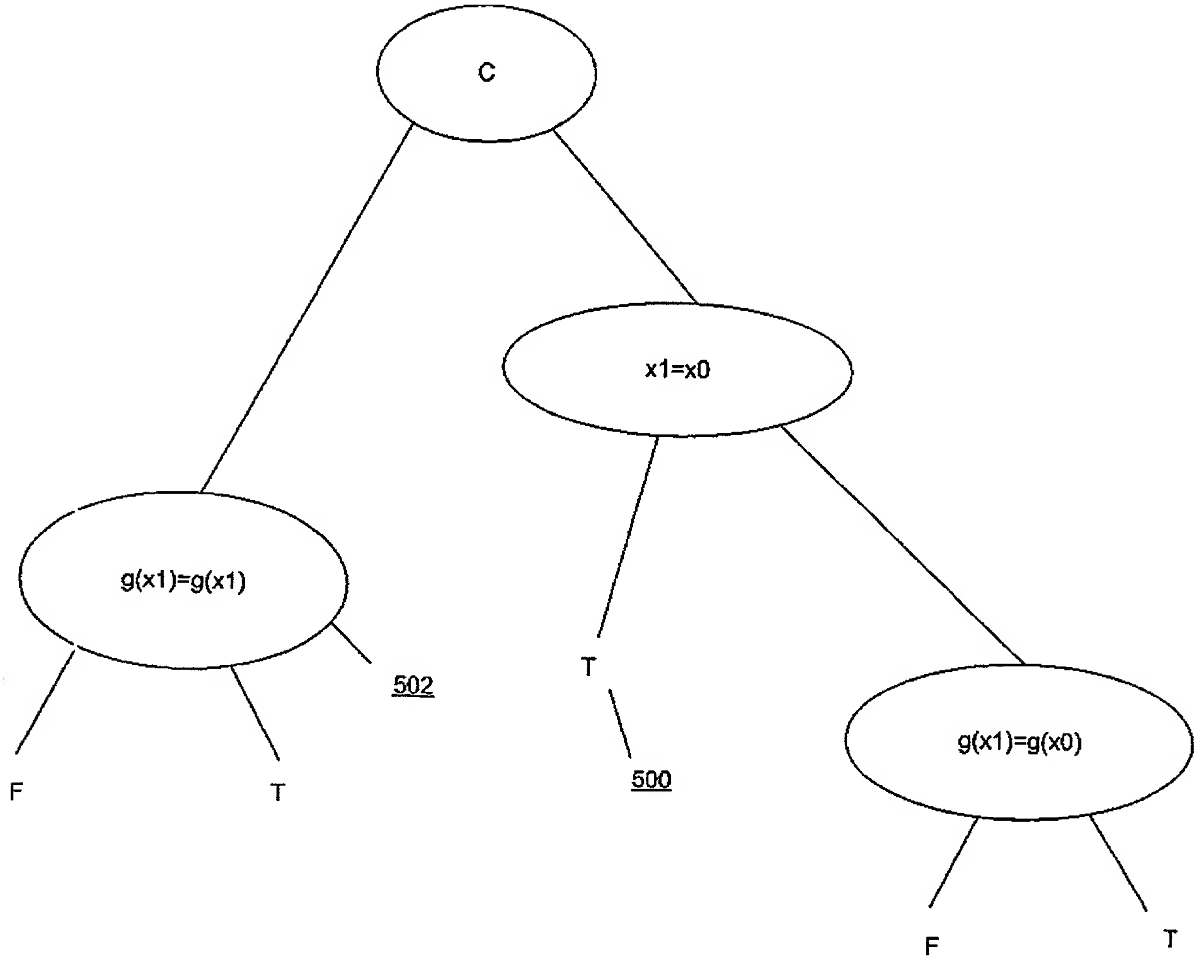

Figure 5

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and Equalities

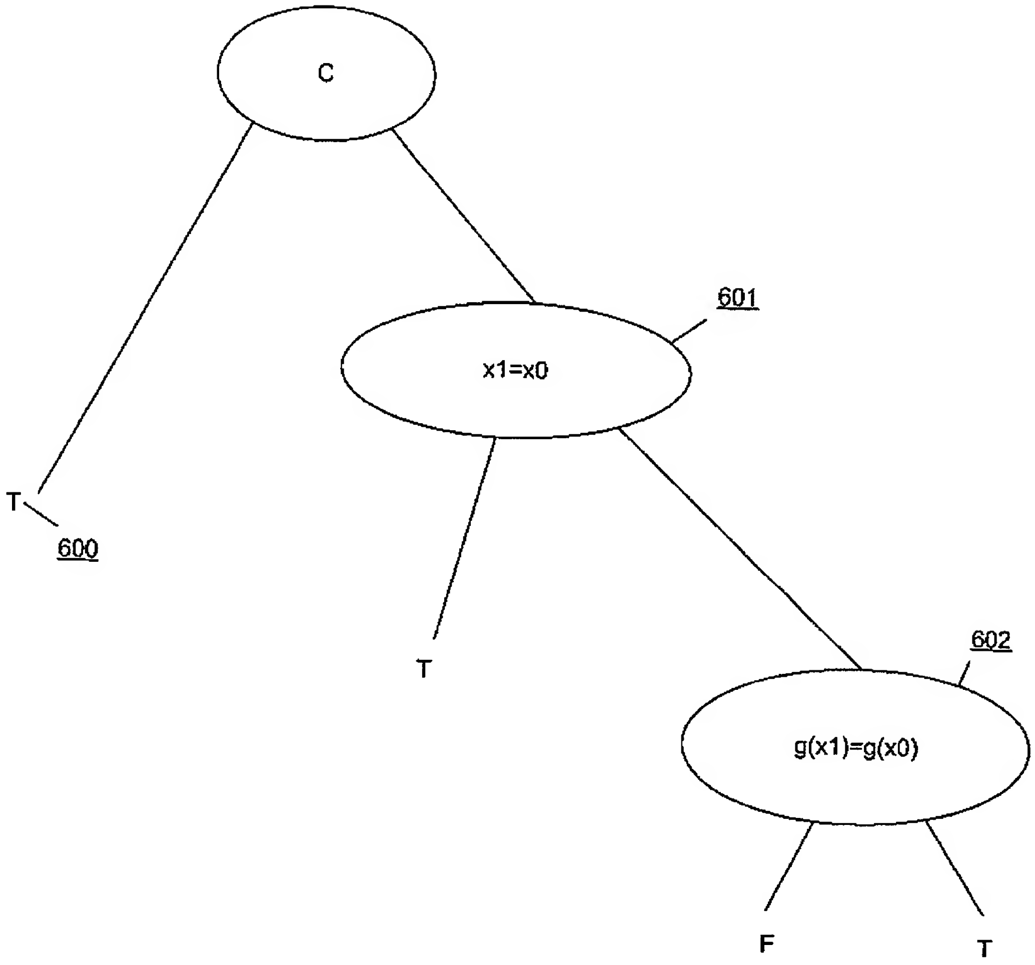

Figure 6

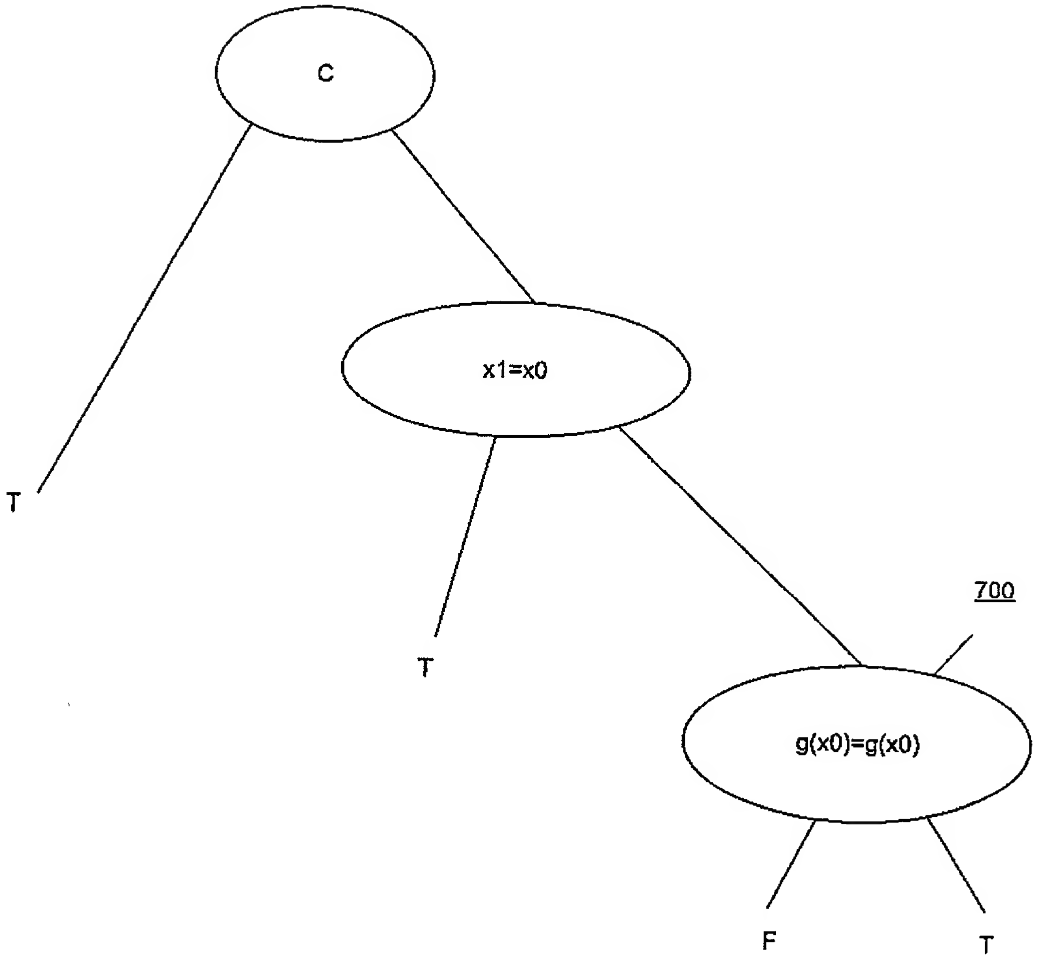

Figure 7

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and Equalities

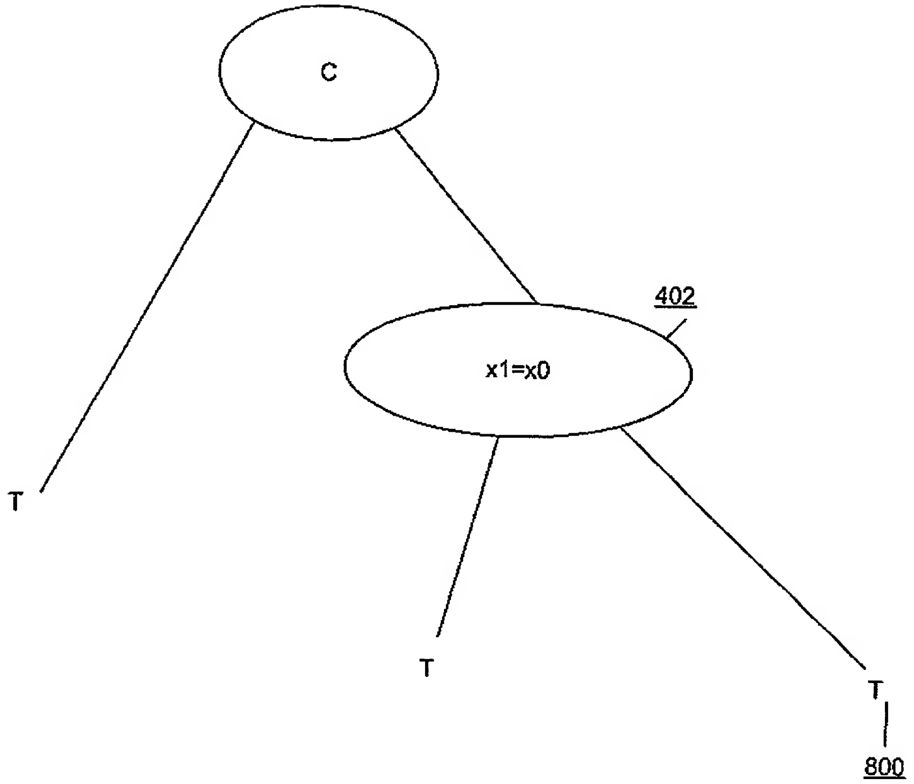

Figure 8

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Hardware Validation Through Binary
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and Equalities

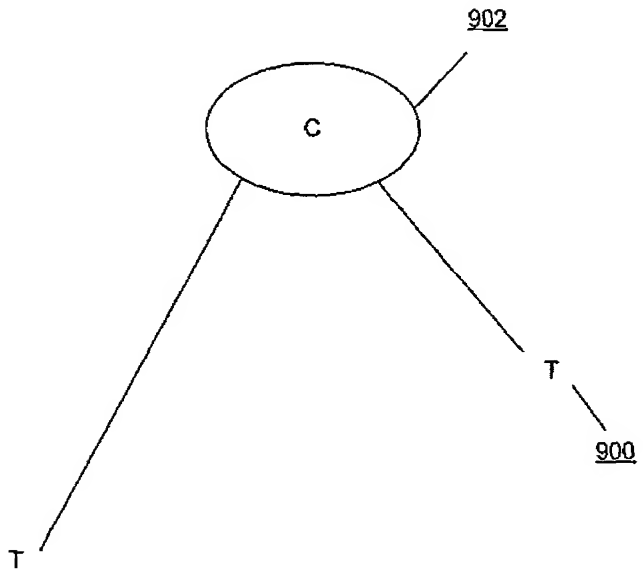

Figure 9

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Figure 10

1100

```
1101  simplify (X,Y) :- sim (X,Z), !, simplify (Z,Y).
      simplify (X,X).

      sim(ite(S=S, H, _), H).
      sim(ite(S=T,H,K), ite(T=S,H,K)) :- gt(T,S).
      sim(ite(_,H,H), H).
      sim(ite(E, ite(E,H,_), L), ite(E,H,L)).
      sim(ite(E, H, ite(E,_,L)), ite(E,H,L)).
1102  sim(ite(E1, ite(E2,H,K), L), ite(E2, ite(E1,H,L), ite(E1,K,L))) :-
            gts(E1,E2).
      sim(ite(E1, H, ite(E2,K,L)), ite(E2, ite(E1,H,K), ite(E1,H,L))) :-
            gts(E1,E2).
      sim(ite(S=T, H, K), ite(S=T, L, K)) :-
            gt(S,T),repl(S,T,H,L), H \==L.          1104
1108  sim(ite(A,B,C), ite(A,X,C)) :- sim(B,X).
      sim(ite(A,B,C), ite(A,B,X)) :- sim(C,X).

      repl(S,T,S,T):- !.
      repl(S,T,P,Q) :-
             P = .. [X|Args],
6            maprepl(S, T, Args, Newargs),
             Q = .. [X|Newargs].

      naprepl(_,_,[],[]).
      naprepl(S, T, [X|A], [Y|B]) :- repl(S,T,X,Y), maprepl (S,T,A,B).

10    gts(A=_, C=D) :- gt(A,C), gt(A,D).
      gts(_=B, C=D) :- gt(B,C), gt(B,D).

2     depth(P,X) :- atom(P), !, X is 0.
      depth(P,X) :- P =.. [_|Args], max_depth(Args,Y), X is Y+1.

      nax_depth([],0).
      nax_depth([A|L],X) :- depth(A,Y), max_depth(L,Z), X is max(Y,Z).

      gt(P,Q) :- depth(P,DP), depth(Q,DQ), DP>DQ, !.
      gt(P,Q) :- P =.. [F|_], Q =.. [G|_], F \== G, gtlex(F,G), !.
      gt(P,Q) :- P=..[F|Args1], Q =.. [F|Args2], gtlist(Args1,Args2).

      gtlist([A1|L1],[A2|L2]) :- A1\==A2, !, gt(A1,A2).
      gtlist([_|L1],[_|L2]) :- gtlist(L1,L2).

1114  gtlex(g,f).
      gtlex(x1,x0).
```

Figure 11

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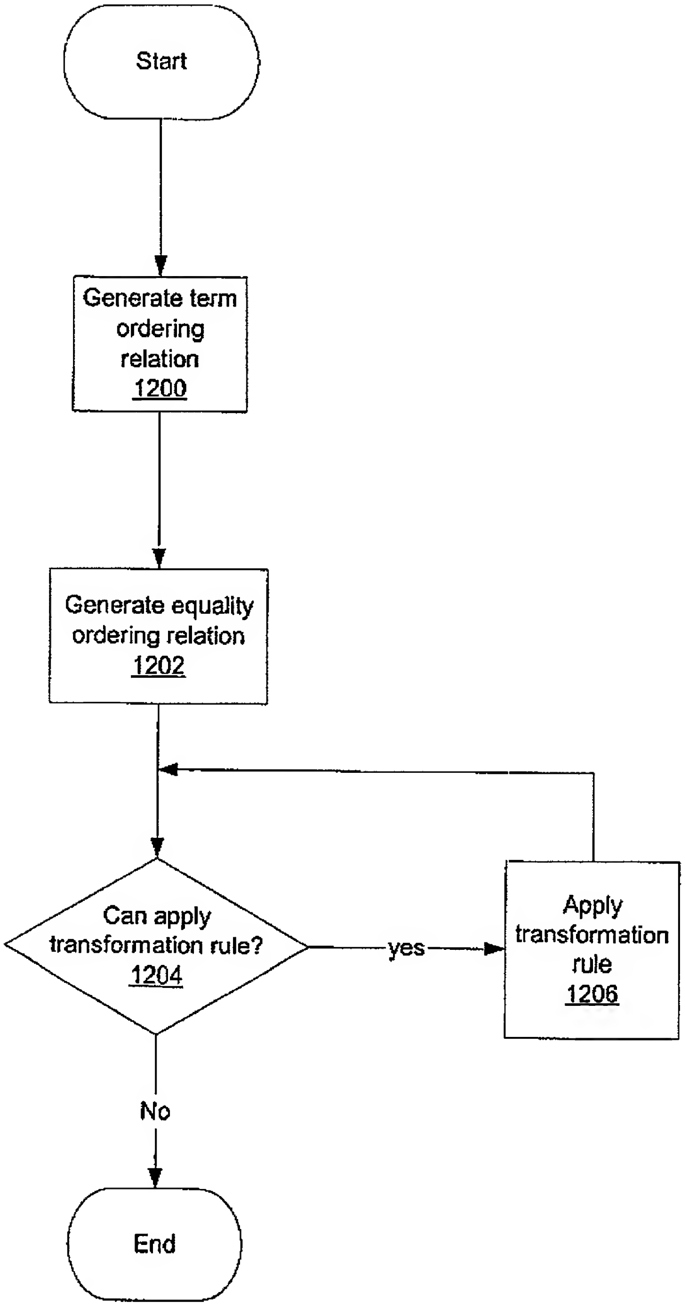
Start
Generate term ordering relation 1200
Generate equality ordering relation 1202
Can apply transformation rule? 1204
yes
Apply transformation rule 1206
No
End

Figure 12

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Hardware Validation Through Binary Decision Diagrams Including Functions and Equalities